INTRODUCTION

The present day world, faced with an ever-increasing population, is constantly trying to find out means for an honourable living by the provision of better food, clothing and shelter. One of the ways to meet this end is a better adjustment of agriculture to the existing socio-economic and physical environment. It is necessary for developing a healthy and prosperous agricultural economy. In countries like India, where a vast majority of population depends upon agriculture, the raising of agricultural productivity is an essential pre-requisite of economic growth. The area of land at our disposal is virtually fixed and cannot be increased to any appreciable degree. The population, on the other hand, is increasing leaps and bounds, so that the preliminary census report of 1981 gives a figure of 680 million for India.

It seems to be an almost desperate situation calling for a balanced use of land. A rational and balanced land use cannot be achieved without a land use survey, and the need for such a survey can hardly be over emphasized. The preservation and perfecting of land resources is one of the greatest problems facing the present day generation. It requires a careful planning of available land resources which are the main assets. Such a planning pre-supposes an extensive and careful land use survey.
Besides, India is a poor country where the majority of population is under-fed and undernourished. The standard of living is very low. The increasing poverty and the consequent hunger and under-nutrition and malnutrition on a large scale are undoubtedly due to the increasing pressure of population on land resources.

The country is faced with an ever-decreasing man-land ratio. In such a situation, it is necessary to get the land resources properly organized and to evolve a balanced policy for the various uses of land. It may be noted that in India agricultural land is not being used as intensively as in some of the West European countries. As pointed out by Clark, if most of agricultural lands of the world were as intensively used as, say in Denmark, the world could support 12,000 million as against the present 3,500 million.

Professor Shafi, in fact, points out that India could support five times its present population with proper management of its agriculture.

It may also be noted that the productivity of agricultural land in India compared to many other countries

is very low. The carrying capacity of land is very low and, therefore, one can well hope that the efficiency of land can be substantially improved by increasing its productivity.

Increased agricultural production may be achieved in two ways: firstly by bringing more land under cultivation, and secondly by increasing the yield per acre. The first method aims at the utilization of every acre of culturable land, the elimination of the misuse of land and the maximization of land use. Without a factual knowledge of the present use of land, it would not be possible to formulate any detailed scheme of land development or to evolve a rational land use policy. This calls for a land use survey and the preparation of an inventory of existing land resources. The task in agricultural planning, therefore, is to record the existing land use on maps which would form the basis of assessment of the use and misuse of land. There is the need to carry out field to field survey throughout the country and to assess the influence of physical conditions, e.g., relief, drainage, climate, soil and other factors on the nature and extent of agricultural land use. The study of the physical conditions should then be supplemented by social conditions to analyse the present land use and to ascertain the optimum use of land.
India, however, is a vast country characterised by many diversities. The physical and socio-economic problems in agriculture are closely interlinked in all parts of the country. The diversity of geographical conditions prevailing in different regions of the country makes it impossible to prescribe any standard solution for these problems. Each region has its own individuality and therefore its problems should be considered in relation to the local environment but, of course, within the national framework.3

For reasons which are only too obvious, it is imperative that plans for agricultural and socio-economic improvements should be ultimately based on local surveys. One such basic survey is that which takes into account the use of land. The present study is based on an agricultural land use survey of the Garhwal Himalayan region and it attempts to find out the effect of land use on the nutritional level of the population.

The Garhwal Himalaya, comprising Tehri Garhwal and Garhwal districts of Uttar Pradesh, lies between 77°58' and 79°15' East Longitude and 29°15' and 30°38' North Latitude. It is bounded by the districts of Uttar Kashi.

Fig 1
and Chamoli in the north, by the district Bijnor on the south, by the districts of Almora and Naini Tal on the east and Dehra Dun in the west.

The districts of Garhwal Himalaya lie almost entirely within the Himalayan mountain system. They contain a series of tangled ridges with innumerable spurs separated from each other by narrow valleys. The general direction of the ranges is from northeast to southwest. There is little level land in this mountainous region, the only significant exception being the pasture lands of Panai on the banks of Alaknanda and those of Srinagar and the sub-mountainous tract. As stated above, the succession of steep mountain ridges are divided from each other by deep valleys which are narrow with precipitous walls. The numerous spurs in the hilly systems of Central Garhwal separate the river valleys from each other. There are narrow terraces at the lower slopes of the hills which are relatively dry.

The Garhwal Himalaya is characterised by a dense dendritic drainage pattern. Consequent streams make short tributaries which cut the valleys obliquely. The tributaries generate deep flowing hill torrents and rivers.

The entire Garhwal region is divided into two drainage systems, namely, the Ganga system, comprising the
Alaknanda, Bhagirathi, Bhilangna and Nayar rivers; and the Ramganga system which consists of Mandal, Sona and Mandalti tributaries.

The land in some parts of the district rises up to 6,900 m. Altitude influences the climate of the districts. A fairly long and moderately severe winter is the chief characteristic of the climate of these districts. Being situated on the southern slopes of the Himalaya, the districts receive a fair amount of rainfall from the Southwest Monsoons. However, in the valleys and on the comparatively lower slopes of the hills tropical heat may be experienced during April and May and even up to the first half of June.

Fertile alluvial soils are found in the river valleys, while the upland areas consist of skeletal soils which are low in fertility.

On the whole, human life here is a continuous struggle for existence against a not too hospitable climate, difficult topography and tenuous communication. Agricultural progress is naturally tardy and slow. Methods of cultivation and agricultural implements are rather simple and primitive. In these circumstances, agricultural yields are poor and the economic condition of the people is far from satisfactory. The average farmer is illiterate and superstitious, and in
his isolation he preserves an ancient culture. It is not surprising that the level of health, and average expectancy of life are low.

The region, though gifted with many potential resources, is suffering from a wide variety of serious problems. A dynamic approach is badly needed. It is only the progress of the village people which can contribute to the progress of the region as a whole.

Though conditions in respect of transport and communication have greatly improved in recent years, a major portion of the region remains almost inaccessible during the rainy season. There is a general absence of metalled roads and bridges over the numerous hill torrents which swell during the rainy season. As a result, a fairly large proportion of the produce of this region, particularly fruits and vegetables, do not find a market, and are allowed to perish. Certain parts of the region suffer from poor transport facilities even in fair weather.

The present study includes and interprets the existing land use pattern of selected villages situated in different altitudes of the Garhwal region. It would have been more useful if the total survey of all the agricultural land were carried out, but keeping in view the cost and
time factors, there is no other alternative except to apply purposive sampling technique. It may, however, be pointed out that most careful steps have been taken in the selection of these villages so that they may be representative of a large number of villages found in homogeneous geographical and socio-economic conditions. The impact of geographical conditions including relief, drainage, climate, and soil on the present land utilization in these villages has been studied in detail and illustrated by maps and diagrams.

A study for the level of efficiency of land in terms of Potential Production Units with the help of per acre yield of various crops grown in different types of land has also been made. With the help of food balance sheets and dietary surveys an assessment of the nutritional level of the people in terms of calories and various other nutrients has been attempted and efforts have been made to establish a correlation between the deficiency or surplus of any particular element of diet and departure from standard requirement. In this way, the total relation of people with their lands has been established and for further development suggestions have been given.